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International Space Station

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PAYLOAD NAME
PAYLOAD TRAINING LESSON PLAN

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PAYLOAD NAME PAYLOAD TRAINING LESSON PLAN

DR OD10
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ABSTRACT

This document presents the Payload Training Lesson Plan (PTLP) for the International Space Station Program (ISSP) *Payload Name (Payload Acronym)*, as agreed upon by the Marshall Space Flight Center (MSFC) Payload Training Integration Manager (PTIM), the MSFC *Payload Acronym* Simulation Engineer (SE), and the Payload Developer (PD). This PTLP defines the scope of the training, provides the lesson plan descriptions, and provides the lesson summaries for the individual Space Station Training Facility/Payload Training Capability (SSTF/PTC) payload training sessions associated with *Payload Acronym* operations. This document will be used in conjunction with the *Payload Acronym* payload simulator for payload crew training at Johnson Space Center's (JSC) SSTF/PTC. This document has been produced under Payload Operations Integration Function (POIF) by the Operations Training Branch, Teledyne Brown Engineering (TBE) according to Data Requirement OD10, Contract NAS8-50000.

KEY WORDS

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SECTION 1, INTRODUCTION

The purpose of this PTLP is to provide a definition of the payload crew training requirements at the JSC SSTF/PTC for the *Payload Name (Payload Acronym)* payload. This document will provide a detailed description of the crew operations training lessons utilizing the *Payload Acronym* simulator in the JSC SSTF/PTC. All of the training sessions defined in this document will be conducted to build and maintain the crew's proficiency in performing payload operations. These training lessons will be rehearsed during the Payload Simulator Training Acceptance Test (PSTAT). Training sessions in preparation for the first increment a payload is deployed, or to provide instruction on payload changes and reconfigurations, will be conducted by the MSFC SE and/or a PD-provided instructor. Subsequent crew training sessions, once the payload training is steady-state, will be conducted by JSC Manned Systems Training (DT) and/or a PD-provided instructor. The crew scheduler, JSC/DT, will block out time in the overall crew schedule for payload training. Within these blocks, the PTIM will set the specific dates and times for the individual payload courses.

1.1 SCOPE

The training to be defined in this document, conducted at the SSTF/PTC, will consist of *provide a list of the "types" of training done at the SSTF/PTC that we are defining in this document (refer to the types listed in the PSRD which do not include complement training and sims).* Refresher training, even though not specifically defined in this document, can be a repeat of lessons that are defined in this document. Note that this document does not address training performed at the PD site or lessons for Payload Complement training sessions or Simulations conducted from the SSTF/PTC.

This PTLP is divided into three major sections and one appendix as follows:

- Section 1 of this document provides an introduction to the PTLP and includes a general description of *Payload Acronym* and its Training Objectives. Top level descriptions of the unique crew training lessons are identified as necessary to accomplish *Payload Acronym* training at the SSTF/PTC. An estimation of the time required for each lesson is provided.

- Section 2 of this document provides the PTC training curriculum for the *Payload Acronym* payload.

- Section 3 provides a detailed description of the classroom and hands-on sessions. It will also define the activity sequences for each of the lessons that are defined in Section 2. These activity sequences provide a top level description of the actions and events which will occur during a specific training session.

- Appendix A provides a list of abbreviations and acronyms used in this document.

1.2 *PAYLOAD ACRONYM* OVERVIEW

This paragraph provides a brief overview of the payload. It should not exceed 2 pages in length and can be taken from the payload overview provided in the PSRD.

1.3 PAYLOAD TRAINING OVERVIEW

The *Payload Acronym* payload has *XX* Training Objectives (TO) as listed in the Payload Data Library (PDL) and defined in the PSRD, Volume 1. These TOs will be the basis for developing the nominal operations Lesson Descriptions detailed in Section 3 of this document. Although there may be a one-to-one correlation between TOs and lessons, this is not required (i.e. several TOs may be combined to form a single lesson).

SSTF/PTC training for the *Payload Acronym* payload will be divided into *XX* lessons resulting in *XX* hours of total training time for each crew member. Table 1-I is included on the following page to show the break down of hours per training lesson as well as the total hours required for *Payload Acronym* PTC training. The courses listed on this table may be repeated at given intervals to maintain the crew's 'ready-to-fly' status. This training may be performed per crew request for refresher lessons or to meet currency requirements.

Include a PDL output table formatted like the table below.

Sample data is included to help illustrate the table format.

TABLE 1-I *PAYLOAD ACRONYM* LESSON DESCRIPTION SUMMARY

SESSION TITLE	COURSE CODE	NO. OF SESSIONS	HRS PER SESSION	TOTAL HRS
Facility Overview		1	4	4
Facility Operations		2	3	6
Sample Fixation		4	2	8
TOTAL HRS PER CREWMEMBER				18

SECTION 2, LESSON SUMMARIES

The following subsections define each of the training lessons listed in Table 1-I. The descriptions include the lesson title, location (classroom, lab, etc.), estimated length, prerequisites, training equipment required, currency requirements for the lesson, and a lesson synopsis. These lesson summaries will be kept up to date in the PDL in the *INSERT APPROPRIATE NAME* output tables. The tables included are effective as of the *baseline/rev. date* of this document.

Section 2.1 is included as an example of what the PDL output table should look like.

2.1 *LESSON ONE TITLE* LESSON DESCRIPTION

LESSON TITLE:
(course number)

LOCATION:

LESSON LENGTH (HRS):

PREREQUISITES:

HARDWARE ELEMENTS:

CURRENCY REQUIREMENT:

LESSON OBJECTIVES/SYNOPSIS:

This paragraph will be a field that is input into PDL by the simulation engineer. This synopsis should end with a statement of the lesson goals such as: "Upon completion of this session the payload crew will be familiar with .....".

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SECTION 3, LESSON PLANS

This section defines preparations and lesson plans for the *Payload Acronym* training sessions identified in Section 2. Section 3.1 summarizes preparations required for the performance of each lesson. Section 3.2 provides an outline of the subject matter to be covered in the classroom training session described in Section 2.1. *(This assumes that each facility's training will begin with a classroom session giving an overview of the facility.)* Sections 3.3 through 3.*X* provide activity sequences to be used for each of the hands-on training sessions described in Sections 2.2 through 2.*X* . The activity sequences include the training event and time of occurrence, instructor actions, trainee actions, and notes on critical activities which occur during the training event.

3.1 PREPARATIONS

Prior to conducting a *Payload Acronym* lesson, the trainer must make preparations in terms of training materials, facilities, and equipment. The preparations necessary for conducting the *Payload Acronym* training sessions defined in this document are listed in Table 3-I. *The document author should add/delete any of the listed resources that are/are not applicable to the payload. Enter session name and add/delete columns to coincide with your lessons. Enter Xs in the appropriate columns to indicate a particular resource is needed for that training session. Be as specific as you see fit to help prepare for and schedule these training sessions.*

3.2 *PAYLOAD ACRONYM* CLASSROOM SESSION PLAN

The classroom session will be conducted by the *Payload Acronym* SE/DT and/or PD under the supervision of the MSFC PTIM. The actual level of detail covered during the classroom session will depend on the individual crew member's prior familiarization with *Payload Acronym* systems and operations. Table 3-II presents the outline for the *Payload Acronym* classroom session. *Adjust this table to fit your desired classroom training presentation. Add/delete items to meet your specific curriculum.*

3.3 HANDS-ON TRAINING SESSION PLAN

This section presents the activity sequences necessary for conducting hands-on training with the *Payload Acronym* simulator. Tables 3-III through 3-X provide the activity sequences for the training sessions described in Sections 2-2 through 2-X. Hands-on training sessions will begin, if required, with a discussion of any changes to the payload operations and simulator that have occurred since the previous session. During the execution of these sessions, any interface between the trainee and the Payload Operations Integration Center (POIC) or PD will be provided by either the instructor, PD representative, or PTIM. Each hands-on training session shall end with a classroom discussion of the day's events including a review of any action items that were assigned.

TABLE 3-I TRAINING PREPARATION CHECKLIST

	SESSION 1	*SESSION 2*	*SESSION 3*	*SESSION 4*
TRAINEE MATERIALS				
Payload Acronym Procedures				
PDL C&DH Tables				
Payload Activity Timeline				
Lesson Handouts				
INSTRUCTOR MATERIALS				
Full set of Trainee Materials				
Payload Acronym PSRD				
Activity Sequences				
Viewgraphs				
FACILITIES/EQUIPMENT				
Classroom				
Viewgraph Machine				
U.S. Laboratory				
Payload Simulator Staging Area				
Payload Acronym Simulator				
JSC Instructor/Operator Station *(with 1153 or PEHG laptop?)*				
RAPS Instructor/Operator Station				
Portable Computer System *(PEHG or 1153?)*				
EPS Simulator				
TCS Simulator				
ECLSS Simulator - Cabin Temp				
ECLSS Simulator - Nitrogen				
ECLSS Simulator - Vacuum				
Unique Simulator Power ?				
35 mm Camera Equipment?				
Camcorder Equipment?				
Tools?				
Other LSE required?				

TABLE 3-II OUTLINE OF *PAYLOAD ACRONYM* CLASSROOM PRESENTATION

TOPIC	RESPONSIBLE PARTY
A. FACILITY OVERVIEW 1. Purpose of facility/Background 2. Types of Science facility supports 3. Facility Description *or* A. PAYLOAD SCIENCE BACKGROUND TRAINING 1. Experiment Description 2. Science Objectives 3. Science Background 4. Previous Studies/Flights	SE/DT and/or PD
B. PAYLOAD SYSTEMS OVERVIEW 1. H/W and S/W overview 2. Commanding 3. Data Collection 4. Payload to ISS System Interfaces 5. Safety As Related to H/W, S/W design	SE/DT and/or PD
C. PAYLOAD OPERATIONS OVERVIEW 1. Activity Definitions Overview 2. Timeline Scheduling Requirements Overview 3. Description of Nominal Operations and Routine Maintenance 4. Description of Corrective Maintenance/Alternate/ Malfunction Operations 5. Operational Safety 6. Stowage and Logistics 7. LSE Interfaces 8. Crew to Ground Interfaces During Operations	SE/DT and/or PD
D. SIMULATOR OVERVIEW 1. Simulator Architecture 2. Simulator Constraints 3. Simulator vs. Flight	SE/DT and/or PD

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TABLE 3-III LESSON X ACTIVITY SEQUENCES

SEQUENCE #	INSTRUCTOR ACTIONS	TRAINEE ACTIONS	INSTRUCTOR NOTES
1	Initialize simulator, both PCTC host system and CPF specific hardware/ software. Verify that CPF GMT matches PCTC GMT.	N/A	
2	Configure Simulator Controller for MIM 3 experiment run.	N/A	Verify CPF hardware properly stowed in launch configuration: - Thermostats Stowed - Camera Stowed (w/film) - CPF Power Switches: OFF - EPSP 9 DC 2: ON
3	N/A	Perform FO-2 Steps 1 & 2: CPF MIM 3.	Experiment initialization
4	Instruct crew to AP 0070 Change Action 4, third column to: 011	Perform AP-01 ' Parameter Change From RUN' .	Change time associated with AP 0070
5	N/A	Perform AP-04 Step 2 'Stop Experiment'	Setup for Thermostat Agitation. This is the identical to the first 4 steps of AP-05.
6	N/A	Perform AP-07 'Motor Drive Battery Pack Change Out'	Performing this activity allows time for experiment cool down.
7	N/A	Perform AP-05 'Thermostat Agitation' beginning with Step 5.	Steps 1 - 4 were performed during Event 6.
8	Direct Crew to AP-01 'Parameter Change From Run.' The New Action Point will be 1024.	Perform AP-01 Steps 1 & 2.	The crew has no nominal activity during the experiment run. Action Point 1024 will force the MIM 3 experiment to the end of its nominal run so that the crew can perform the remaining FO-2 steps.
9	N/A	Perform AP-10: Magnetic Stirring	Allows time for sample cool down prior to Experiment Deactivation.

TABLE 3-III LESSON X ACTIVITY SEQUENCES

SEQUENCE #	INSTRUCTOR ACTIONS	TRAINEE ACTIONS	INSTRUCTOR NOTES
10	Direct crew to continue from FO-2 S 128.	Perform FO-2 Step 128: Turn Laser and Camera Off; Remove & Stow Thermostat, Exchange Film Magazine.	Completes a nominal experiment run.
11	Nominal Ops Training Complete.		

The data shown in this table is included as an example.
The actual number of tables in your document should be equal to the number of training lessons defined minus one.
(The classroom session does not require a script since no simulator action is involved.)
The font size drops to10 pt. to get more text on a single line.

TABLE 3-III LESSON XX ACTIVITY SEQUENCE

SEQUENCE #	INSTRUCTOR ACTIONS	TRAINEE ACTIONS	INSTRUCTOR NOTES

TABLE 3-IV LESSON XXX ACTIVITY SEQUENCE

SEQUENCE #	INSTRUCTOR ACTIONS	TRAINEE ACTIONS	INSTRUCTOR NOTES

APPENDIX A

ABBREVIATIONS AND ACRONYMS

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A, ABBREVIATIONS AND ACRONYMS

Below is a list of the acronyms used in this document.

Be sure to review your document for identification of all acronyms in this listing.

DRR	Document Release Record
DT	Manned Systems Training (JSC)
ECLSS	Environmental Control and Life Support System
EP	Experiment Processor
EPS	Electrical Power System
g	gravity
ISS	International Space Station
ISSP	International Space Station Program
JSC	Johnson Space Center
LSE	Laboratory Support Equipment
MSFC	Marshall Space Flight Center
PCS	Portable Computer System
PD	Payload Developer
PDL	Payload Data Library
POIC	Payload Operations Integration Center
POIF	Payload Operations Integration Function
PSTAT	Payload Simulator Training Acceptance Test
PSRD	Payload Simulator Requirements Document
PTC	Payload Training Capability
PTIM	Payload Training Integration Manager
PTLP	Payload Training Lesson Plan
SE	Simulation Engineer
SSTF	Space Station Training Facility
TBE	Teledyne Brown Engineering
TCS	Thermal Control System
TO	Training Objective
TSC	Training Support Contractor

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